**Name**: Norman Rollock

**Date**: July 18, 2014

**Course Instructor**: Shakira Provasoli

**Class**: Water, Energy, and Waste: Integrating Themes of Sustainability into Your Classroom (NYSunWorks)

**Modified by; Teacher- Norman Rollock**

**Source: sciencehowmuchcompostablegarbagedoweproduce46**

**Final:** Lesson Plan

**Title** *– How much garbage do we produce?*   
**Science Subject Areas:** *Environmental Science, Earth Science*

**National Standards:**

* *Standard C: Organisms and their environment*
* *Standard D: Changes in the earth and sky*
* *Standard E: Implement a solution; Communicate a problem, design, and solution*
* *Standard F: Types of resources; Science and technology and local challenges*

**Overview:**

* *Students will determine how much waste they produce a day and how much of that waste is compostable. Using their new knowledge, they will present their information to the school to demonstrate the benefits of composting.*

**Objective:**

* *Students will be able to work together to create change in their school.*
* *Students will understand where trash comes from and where it goes.*

**Materials:**

* RolypigÃ‚Â© composter, Scale, Data sheet, Pencil , Two buckets labeled Compost,
* Non-compost , Rubber Gloves,

**Professional Development Competency:**

Domain 3: Instruction

Competency 3c – Engaging students in Learning

**Background:**

In the United States each person produces approximately 3.5 pounds of trash a day, of which 25% is food and yard waste that is biodegradable. When this is put in a landfill, it can take years to decades to decompose. When it is left outside or put in a composter, it will decompose in as little as a few weeks to a few months. Once this material is turned into dirt, it can be used as fertilizer in gardens or left on the ground to fertilize the local flora and fauna. If this trash is put in a landfill, those valuable nutrients will not return to the ground to be used by plants.

**Vocabulary:** *Organisms, environment, compostable, biodegradable, flora and fauna.*

**Procedure:**

**1.** **Do Now:**

a. In their journals

. Record how much trash you think you produce a day.

. What item do you think takes up the most space in your trash?

**2**. **Class discussion:**

a. Review students answers from their journals

 b. Where does the garbage go?

 c. How might they reduce the garbage?

* + - * Recycling, Reuse, Composting

d. What is composting?

* + - * What can be composted and what cannot be.

**3.** **The project:**

1. Break the students into groups and have each group write a letter to various people in the school explaining the project and why it is important.

. Parents . Principal . Kitchen staff . Students . Custodians

b. Assign a student to be in charge of the buckets during lunch.

* + - * Each student will divide their waste into two groups, compost and garbage, depositing their waste into the respective bucket.

c. During class have the students weigh the material in the buckets and record their data.

* + - * Weight
      * What was thrown away?

d. **Homework**

* + - * Have students create posters to be posted around the school. Posters can include
        + What can be composted and what cannot.
        + What is composting?
        + Why composting is important?
        + How much trash do we produce and what happens to it?

**4.** **Day 2:**

a. During lunch make sure the students assigned to buckets are at their buckets.

 b. Have each student divide their waste and put it in the appropriate bucket.

 c. During class have the students weigh the food scraps and put the food in the RolypigÃ‚Â©. Throw out the rest of the garbage.

 d. **Record data**

* + - * Weight
      * Observation

**6.** When the compost is done, have the students find a location at the school where the compost can be used.

**7.** Have students compare their data and present to the school how much waste can be saved by composting and why the school should compost.

**Assessment:**

**Name:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Data:**

1. Total waste collected in pounds: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Total compostable waste collected in pounds:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Total non-compostable waste collected in pounds:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Percentage of waste that is food waste:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Observations:

**Questions:**

1. What items couldn’t be composted and why?

2. Why do you think it might be important to compost?

3. What other solution can you think of to reduce the amount of trash produced?

4. Why is it important to reduce the amount of trash we produce?

**Rubric for Conducting an Experiment in the Lab**

**Task description:** Conduct the assigned lab using the procedures and methods described below. Turn in your laboratory report at the beginning of the next class period.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Exemplary** | **Competent** | **Needs Work** |
| **Materials** | All materials needed are present and entered on the lab report. The materials are appropriate for the procedure. The student is not wasteful of the materials. | All materials needed are present, but not all are entered on the lab report, or some materials are absent and must be obtained during the procedure. The materials are appropriate for the procedure. | All materials needed are not present and are not entered on the lab report. The materials are not all appropriate for the procedure or there are some major omissions. |
| **Procedure** | The procedure is well designed and allows control of all variables selected. All stages of the procedure are entered on the lab report. | The procedure could be more efficiently designed, but it allows control of all variables selected. Most stages of the procedure are entered on the lab report. | The procedure does not allow control of all variables selected. Many stages of the procedure are not entered on the lab report. |
| **Courtesy and safety** | While conducting the procedure, the student is tidy, respectful of others, mindful of safety, and leaves the area clean. | While conducting the procedure, the student is mostly tidy, sometimes respectful of others, sometimes mindful of safety, and leaves the area clean only after being reminded. | While conducting the procedure, the student is untidy, not respectful of others, not mindful of safety, and leaves the area messy even after being reminded. |
| **Purpose** | Research question and hypothesis are stated clearly, and the relationship between the two is clear. The variables are selected. | Research question and hypothesis are stated, but one or both are not as clear as they might be, or the relationship between the two is unclear. The variables are selected. | Research question and hypothesis are not stated clearly, and the relationship between the two is unclear or absent. The variables are not selected. |
| **Data collection** | Raw data, including units, are recorded in a way that is appropriate and clear. The title of the data table is included. | Raw data, including units, are recorded although not as clearly or appropriately as they might be. The title of the data table is included. | Raw data, including units, are not recorded in a way that is appropriate and clear. The title of the data table is not included. |
| **Data analysis** | Data are presented in ways (charts, tables, graphs) that best facilitate understanding and interpretation. Error analysis is included. | Data are presented in ways (charts, tables, graphs) that can be understood and interpreted, although not as clearly as they might be. Error analysis is included. | Data are presented in ways (charts, tables, graphs) that are very unclear. Error analysis is not included. |
| **Evaluation of experiment** | The results are fully interpreted and compared with literature values. The limitations and weaknesses are discussed and suggestions are made as to how to limit or eliminate them. | The results are interpreted and compared with literature values, but not as fully as they might be. The limitations and weaknesses are discussed, but few or no suggestions are made as to how to limit or eliminate them. | The results are not interpreted in a logical way or compared with literature values. The limitations and weaknesses are not discussed, nor are suggestions made as to how to limit or eliminate them. |